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This Issue

OUR COVER PORTRAIT

MERLE E. FRAMPTON, PH. D., LL. D., is professor of education and head of the Department of the Handicapped, Teachers College, Columbia University, and is principal of The New York Institute for the Education of the Blind, New York City. He served on President Hoover's White House Conference and has had a most varied career in religious education, special education, sociology, and child welfare. His undergraduate work was done at Boston University and his graduate at Harvard University, Cambridge, Massachusetts. It was his honor to hold fellowships in both institutions.

Dr. Frampton returned from South America late in November where he for the past two years has been assisting the Argentine and Brazilian governments in a preventive education and rehabilitation program for the various types of handicapped persons. He also holds the special honor of being chairman of the Exceptional Children's Committee of the World Federation of Education Associations.

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Vol. 6 No. 6 March, 1940

Spasticity

Melba M. Miller

THE problem of and the treatment for birth-injured children has recently become one of increasing importance and interest. The number of these cases is now known to be greater than was formerly realized because of better medical diagnosis and more accurate census recording. National surveys showing this trend present the following statistics on the distribution and causes of crippling conditions.

dred years ago when Denis, Billard, and Cruveilhier wrote several articles from 1826 to 1835 in which they suggested a relationship between intracranial hemorrhage at birth and the later development of cerebral spastic paralysis. However, credit for the first real study of the condition is given to Dr. William John Little (1810-1894), an English orthopedist, who published his famous article *On the Influence of Ab-*

Causes of Crippling Conditions[1]

Percent of Incidence by Years			Rank
1914	1924	1930	1938
Bone and joint tuberculosis 39.5	Poliomyelitis 27.26	Poliomyelitis 33.7	Poliomyelitis *First*
Poliomyelitis 24.3	Bone and joint tuberculosis 23.65	Birth injuries 14	Congenital deformities *Second*
Birth injuries 3.5		Bone and joint tuberculosis 12.6	Birth injuries *Third*
(6th place in rank order)			

The United States Bureau of Census Report for 1927 states that the death rate due to birth injury is 5.8 per 1,000 births for boys and 3.7 per 1,000 births for girls, the average being 4.8 per 1,000 births.

Ten per cent of births suffer injury severe enough to produce blood in the cerebrospinal fluid.

The birth injured were recognized as a medical classification about a hun-

normal Parturition, Difficult Labors, Premature Birth, Asphyxia Neonator-

[1] Frampton, M. E., and Rowell, H. G., *Education of the Handicapped*, Vol. I, p. 135.

• Melba M. Miller, M. A., is a teacher of a special class of mentally handicapped girls in the Sterne Brunson School of Benton Harbor, Michigan. She was formerly a teacher of normal children in Oak Park, Illinois. Her undergraduate training was taken at the University of California, Los Angeles, and her graduate work was taken at Teachers College, Columbia University, New York City, where she specialized in the education of mentally handicapped and orthopedic children.

Miss Miller is a member of the International Council for Exceptional Children.

um, on the Mental and Physical Condition of the Child, Especially in Relation to Deformities in 1862. Dr. Little said that 75 per cent of cerebral spastic paralysis cases were caused by hemorrhage at birth. He described the disability, sometimes now called Little's Disease, as one who walked with a scissors gait, drolled, grimaced, and was feeble-minded.

Poliomyelitis[2] and spasticity were considered the two large groups of neuro-muscular handicaps in the nineteenth century. Poliomyelitis, commonly called infantile paralysis, was flaccid paralysis and spasticity was regarded as the opposite. It has since been found that less than 50 per cent of nonflaccid paralysis is spastic. It is, therefore, wrong to use the term spastic in a generic sense as it is so commonly misused today. Dr. Little gave the impression that all birth-injured subjects were also feeble-minded. Consequently, interest in and treatment for the spastic was negligible for a long time since the general concensus of opinion agreed that it was useless even to try to improve such a handicapped person. Recently it has been proved that by no means are all spastics feeble-minded, and that mental progress advances along with muscle training.

In 1885 Sarah McNutt agreed with Dr. Little's theories through her study by necropsy, better known as the post-mortem examination. Then two German doctors studied birth lesion cases. Beneke in 1910 explained a new method of autopsy that left the tentorium[3] intact, by which he pointed out the unrealized frequency of rupture of the tentorium membrane followed by hemorrhage in the motor area of the brain. Beneke's study was further developed by Seitz in 1912.

From this meager beginning neurologists, obstetricians, and psychologists have advanced research on cerebral palsy from several points of view. The neurologists thought that the permanent motor and mental disabilities were definitely caused by cerebral hemorrhage at birth, while the obstetricians discredited its importance. Mental specialists have been very slow to study the relationships between birth injury and mental development. Until recently the only literature available was to be found in medical journals rather than in psychological ones. Dr. E. A. Doll, director of Research at the Training School at Vineland, New Jersey, and Dr. Elizabeth Lord at Children's Hospital in Boston are present leaders in the psychological field.

. Tredgold states in both the first edition in 1908 and in the fifth edition in 1929 of his well-known *Mental Deficiency* that the cause of cerebral palsy is due to morbid heredity. He thought that the importance of the abnormalities of labor causing amentia, or mental deficiency, was much overemphasized, and he did not see the need of starting training as early as possible.

Hardt was one of the first to use the Binet-Simon Scale for cerebral palsies although his group included encephalitis, or inflammation of the brain, as well as other disabilities. He first administered the test in 1914 to those under his supervision in the Lincoln State School, Lincoln, Illinois.

Although the whole problem of the birth injured is by no means solved, a fairly clear and definite discussion can be given. Doctors Bronson Crothers,

[2] An infectious crippling disease which is caused by a filterable virus.

[3] Dura mater that forms a partition between the cerebrum and cerebellum and covers the upper surface of the cerebellum.

E. R. Carlson, and W. M. Phelps are foremost authorities on cerebral palsy at the present time though they differ in their philosophy and treatment of palsies.

Cerebral palsy is the proper technical term used to describe the five types of impairment of the power of voluntary movement known as dyskinaesia. The hazards of child bearing are many, and at birth damage may be done the intracranial portion of the central nervous system. Cerebral lesions, which cause the damage, occur during the last months of pregnancy, at birth, or during the first two or three weeks of life. The three chief factors that contribute to the injury are due to a congenital condition, disease, or mechanical difficulties.

Congenital conditions include malformation of the child with difficult delivery and definite injury resulting. Syphilis delays the development of the walls of the blood vessels. Because of the delicate walls and stress from external air pressure, a hemorrhage may result. The change from high uterine pressure to low atmospheric pressure may cause birth injury in a normally formed but premature child. Congenital heart disease causes a rapid delivery and often an obstetrical injury.

In birth injury due to disease, infection in the blood stream of the mother which in turn infects the child is the most common cause. Icterus neonatorum, which means *jaundice of the new born child,* is responsible for some cases.

Mechanical complications are numerous, and, in the opinion of Dr. Crothers, form the most important single cause of injury. The position and size of the child for delivery and the order of his birth in the family are important factors. Primiparity, the situation in which a woman bears one child and no more, is a condition that definitely increases the possibility of damage by hemorrhage, especially if the child is a male which is likely to be larger than a female. A breech extraction is particularly dangerous. A disproportionate distribution of blood supply between the brain and trunk during too long a period of labor or too rapid labor can also cause cerebral hemorrhage.

Among conditions of dystocia, or difficult delivery, that can cause birth injury are overlapping of cranial bones when the head passes through a very small birth canal, asphyxiation with prolonged labor, or too tight application of instruments. Of the children instrumentally delivered, only 3 per cent suffer birth injury, a very small group compared to the total number of births. The higher the forceps is placed on the child's head for delivery, the greater is the percentage of birth injury. In the delivery of the shoulder of a child born in the usual position, head first, there may occur a lateral bend of the head to one side. This increase in the distance between the acromion[4] and the mastoid tears the brachialplexus, a complex network of nerves to the chest, shoulder, and arm, thereby causing Erb's palsy. Excessive direct pulling on the head stretches the neck in a straight position and may tear the tentorium cerebeli[5] and rupture the vein of Galen with a consequent hemorrhage at the base of the brain. This injury is the most common cause of athetosis.

While intracranial injury results chiefly from the direct effects of a hem-

[4] Outward extension of the spine of the scapula forming the point of the shoulder.

[5] An arched fold of dura mater, the tough fibrous membrane lining of the brain and spinal cord.

orrhage, damage can be due to the indirect effects and also to other causes. For example, lack of nutrition to certain areas of the brain occurs when a vessel leading thereto is ruptured. The area that should have been supplied by these vessels does not receive sufficient nutrition, and the resulting changes in nervous tissue produce permanent damage. Necrosis, sometimes called gangrene, also occasionally occurs, with the resulting abscess followed by direct infection of the cortex.[6]

Serious injury to the central nervous system is more likely to happen to the first-born child than to those later born. Dr. Crothers believes that "a few cases are unquestionably hereditary in nature."[7] No less an authority than Goddard also states that "we have in all these cases a substratum of hereditary defect, occurring in a stock, normal indeed in itself, but so near the borderline that a small additional shock produces marked effect."[8] Dr. Phelps, on the other hand, reports that the majority of birth injuries occur in families that are "relatively normal in heredity."[9]

The injury can be a mild one without permanent consequences, the damage evidently being repaired through natural growth processes. Injuries involving the entire brain are fatal and seen only at autopsy. They are caused by multiple petechial, or spotted, hemorrhages from many veins, a condition usually resulting from disease such as syphilis. Many birth injured die in early infancy. Those who survive have physical, mental, or behavior handicaps or a combination of disabilities varying from mild to severe degrees. Motor impairment, mental deficiency or retardation (with consequent difficulty in learning), disturbance of personality and conduct sensory handicaps, (especially of hearing and sight) and muscular disturbances in vision, are permanent results of a cerebral birth lesion.

It is often difficult to diagnose a cerebral palsy case, for parents do not always realize until months and sometimes years later that their child is not developing normally. They often attribute the disability to other causes. However, the etiology[10] of the case can usually be reconstructed. Symptoms of hemorrhage are characteristic of the birth-injured child. At birth asphyxia[11] is well marked. This is because of the vasomotor collapse due to medullary[12] injury; respiration is slow and irregular, and the pulse is feeble; the pupils may be contracted or unequal. The anterior fontanel, an unossified section of the cranium of a young infant, is tense and may bulge, and the sucking reflex is absent. In a few days convulsions occur, especially in a cortex type hemorrhage, and a lumbar puncture shows blood in the spinal fluid which is under increased pressure. Following this immediately flaccid period the cerebral palsy infant is very restless and cries almost incessantly because of the pain caused by stretching the dura mater.[13]

[6] Surface layer of the brain.

[7] Crothers, B., in Lord, E. E., *Children Handicapped by Cerebral Palsy.*

[8] Goddard, H. H., *Feeble-Mindedness: Its Causes and Consequences.*

[9] Doll, E. A., Phelps, W. M., and Melcher, R. T., *Mental Deficiency Due to Birth Injuries.*

[10] The investigation of the cause of any disease.

[11] Suspended animation due to deficiency of oxygen and excess of carbon dioxide in the blood.

[12] Injury to the lowest or posterior part of the brain.

[13] The tough, fibrous membrane covering the brain and spinal cord.

The birth injury produces one of five types of dyskinaesia, or, more commonly, a combination of types since a pure form seldom occurs. The cerebral lesion causes spasticity in 40 per cent of cases, athetosis in 40 per cent, with synkinaesia or overflow, ataxia or incoordination, and tremor forming the remaining 20 per cent of cases.

Athetosis is a series of involuntary motions that affect one muscle after another throughout the extremities without any special order of contraction. These involuntary movements are superimposed upon a fairly well coordinated voluntary movement. The contradictions may be rapid or slow and are entirely beyond the control of the individual. Pure athetosis results from damage to the lenticular nucleus, a mass of gray matter at the base of the brain.

Incoordination in the most frequent disability in the 20 per cent intracranial group. It is the inability to direct movement in the desired direction because of loss of muscle sense and a loss of equilibrium. These cases are chiefly cerebellar in origin.

Tremor, due to damage to the globus pallidus[14] is rhythmical and recurrent and may be fine or coarse, intentional or nonintentional. There may be tremors of two or three different joints at different speeds.

Overflow is motion of unessential muscles simultaneous with directed motion elsewhere. The familiar gesture of extending the tongue during concentrated effort is an example of an overflow activity. In birth injured cases unnecessary motions are, of course, excessive.

This paper is now specifically concerned with an explanation of spasticity and its treatment. The size and location of the hemorrhage determines what part of the body is paralyzed. There are five types of spastic paralysis. Pyramidal injury, or injury to the motor area of the brain, results in hemiplegia[15] when the hemorrhage covers the cortex on one side, for the muscles on one side of the body are in general controlled by the opposite side of the brain, thus an unilateral disability can occur. Hemorrhage at the vertex, or crown of the head, causes diplegia[16] or paraplegia.[17] Triplegia[18] and quadreplegia[19] are more severely handicapped forms of spasticity.

Motion depends upon contraction of muscle fiber. Contraction takes place when the cell in the anterior horn of the spinal cord sends an impulse along the motor nerve. This impulse is released when the anterior horn cell is stimulated by any one of the following cell groups: sensory cells produce simple reflexes; spinal cells act together to produce elaborate spinal reflexes; cells in the cerebellum send impulses to the anterior horn cell to maintain balance; basal gangalia cell masses influence muscle tone and automatic associated movements such as articulation and swallowing; and cells in the cortex produce voluntary planned movements.[20]

A hemorrhage in the cortex of the brain causes the muscular condition of spasticity which is hyperirritability to any stimulus. There is simultaneous

[14] The pale interior of the lenticular nucleus.

[15] Paralysis on one side only, the right side or the left.

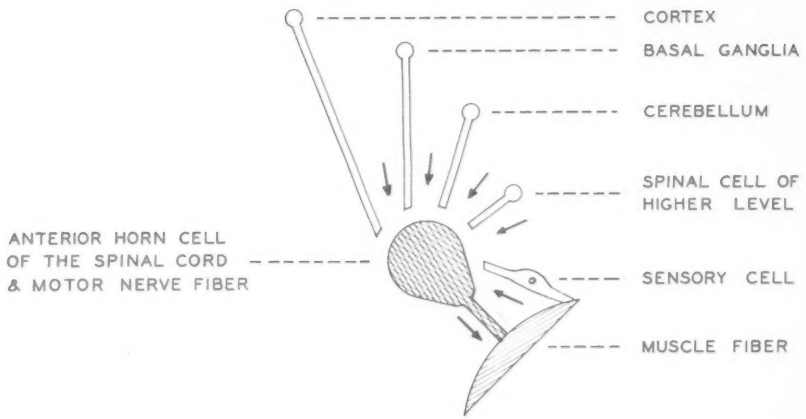
[16] Paralysis of symetrical parts, both legs or both arms.

[17] Paralysis of the lower half of the body.

[18] Paralysis of any combination of three extremities.

[19] Paralysis of all the extremities.

[20] Crothers in Lord, *op. cit.*



IMPORTANT ELEMENTS IN THE CONTROL OF MOTOR ACTIVITIES

Copied from page 3 (Chapter I, "Medical Explanation" by Bronson Crothers, M. D.) of the book *Children Handicapped by Cerebral Palsy*, by Elizabeth Evans Lord. Reproduced by permission of the publishers, The Commonwealth Fund, New York City.

and hypertonic contractions of antagonistic muscle groups. Normally the muscles act reciprocally so that while one set contracts the antagonistic group relaxes. In spastics there is simultaneous contraction and, therefore, movement is performed only with difficulty and delay. Thus, the typical spastic motion is slow and awkward.

Because spasticity is a constant condition the spasticity of each individual muscle can be determined by extending the flexed part. If stretching the muscle by extending it causes resistance as soon as the motion is started, that special muscle is spastic. Thus the voluntary attempt to flex the knee quickly when the quadriceps[21] are spastic results in their contraction and blocking of motion which is the usual picture of a spastic's attempt to move a joint. Similarly, clapping the hands will throw spastic muscles into complete contraction, while normally there is only partial contraction. All the muscles of the leg or arm will not be spastic. Those muscles that do not resist are normal and contract normally, or they are flaccid and are not capable of contraction.

The toe walker and the heel walker are true spastic conditions and illustrate very well the stretch reflex. In the toe walker the gastrocnemius soleus muscles[22] are spastic. If the tibialis anticus[23] is a normal muscle, it will slowly pull the flexed foot up against the spasm of the gastrocnemius soleus

[21] The great muscle in the front of the thigh which is divided into four parts that unite to form a single tendon at the knee and extend down into the lower leg.

[22] The two largest muscles in the calf of the leg which unite at the heel to form Achilles tendon.

[23] Muscle on the tibia or *shin* bone which is inserted by a long tendon into the first metatarsal bones of the foot.

muscles. If the tibialis anticus is a flaccid muscle, it does not counterbalance the gastrocnemius soleus and the patient is a typical toe walking spastic. Each time the foot is placed on the ground a stretch reflex is given the spastic muscles and this constant exercise makes the gastrocnemius soleus all the stronger. In order to strengthen the weak antagonistic muscles (tibilias anticus) a corrective heel is put on the shoe which rests the gastrocnemius soleus muscles. They become weaker through disuse and a balance in strength is effected between the two sets of muscles. In the heel walker, on the other hand, the spasm is in the stronger tibilias anticus muscle.

Marked hypertonicity of the muscles is a part of the spastic condition. The degree of hypertonus determines the degree of spasticity. The antagonistic and reciprocal muscle groups may or may not be even in muscle tone. For example, the cross-legged gait of the paraplegic spastic is due to greater spasticity and muscle tone in the adductor muscles[24] compared to their antagonists, the abductors.[25] Gravity is also assisting adduction. The scissors walk and position is the result with both sets of muscles in spasm.

The cerebral palsy injury is a fixed damage. All the injury there is or will be is done *at birth* and it will not increase later. Nerve cells are never replaced, however, so the injury is a permanent one. The condition remains static or is progressively improved, therefore, it is important to treat those who can improve and especially those whose mentality is not too severely impaired.

Surgery is not a cure in itself for cerebral palsy, and should be used only when it will aid the muscle-training program. Nevertheless, in the early part of the twentieth century several poliomyelitis operative procedures were adapted. The first was a tenotomy. A tendon is cut to lessen the power of a group of muscles and so relieve a contracture. The results are irreparable and not altogether successful because of the corresponding damage to the power of the joints. Instead of the original spastic contracture, a flaccid condition is created which is often followed by a new contracture in the opposite direction.

Then tendon lengthening was thought to be more successful than tenotomies. It is difficult, however, to lengthen the heel cord to the proper degree, and if braces are not used afterwards, a recontracture or tendon rupture often results.

The Stoeffel operation originated by Dr. Adolph Stoeffel cuts some or all of the nerve supply of muscles concerned in a contracture. For example, if the nerves are cut in the posterior part of the knee, the power of the gastrocnemius seleus muscles is greatly reduced or entirely destroyed depending on the number of nerves cut. While the muscles are now flaccid, if full dorsiflexion is not possible, the heel cord is then lengthened at the same time. Improvement is definite, but not always permanent as the contracture may return with regrowth of the nerves unless an inch or more of nerve is removed. Novocain injections in the nerve trunk is a wise test to make before such an operation. It shows what effect can be anticipated by stopping the functioning of the nerve group temporarily.

Alcohol injection in the motor nerves produces a paralysis from four to six

[24] Adductor muscles draw toward the center or median line.

[25] Abductor muscles turn outward or withdraw from the axis of the body.

months. During that period the antagonistic muscles can be trained while the protagonistic group are inactive, and a more equal balance in strength can be gained. For extremely handicapped conditions, resection of motor roots resulting in complete flaccid paralysis is done. The use of braces may then be more successful than the original spastic condition. Tendon transplantations may help to improve balance.

Operations are now being used in fewer cerebral palsy cases and those are carefully selected. Motor reeducation which requires much patience over prolonged periods of time is gaining favor. Unless the mentality is so deficient that the child will always be dependent upon adult care, muscle training should be started as soon after birth as it is possible. Muscle re-education is given about an hour a day with a month's vacation during the year to prevent staleness. The exercises should be administered by a physiotherapist or one trained to perform them correctly.

The purpose of motor re-education is to obtain reciprocal motion or the normal, even balance of strength between the antagonistic and protagonistic sets of muscles. The first essential is to secure relaxation before muscle training is started. Reciprocal motion is at first passive, being done by the instructor, then the patient assists in the motion, and finally he develops independent reciprocal movement.

There is a difference of opinion as to how this program should be carried out. Miss Thomas and Miss Rodgers who direct Robin Hood's Barn, a camp for cerebral palsies in Vermont, and Dr. Carlson and Dr. Lord believe that relaxing and exercises should be accomplished through games and imaginative play. One example will illustrate this method. The most important use of the hands is grasping and ungrasping. Rather than have the child repeat a formal exercise to develop this skill, these leaders would suggest that the child wash doll's clothes. The ingenuity of the instructor would be severely taxed to devise a sufficient variety of play activities to maintain the child's interest in the daily exercise period over the long number of years that is required to make definite progress.

The contrasting philosophy, held by Dr. Phelps, is that the child should realize that muscle training is an integral part of his education necessary to his participation in normal living.

First the patient is taught to relax as completely as possible. He lies supine upon the mattress with support preventing any strain on the contracture. Quietness and privacy are necessary. First the muscles in the smallest single joint are loosened, then those in the intermediary joint, and lastly the large joints and muscles are relaxed, for example, fingers to wrist, elbow, and then shoulder. The patient learns to keep himself in the relaxed state. Lullabies or stories may be used to induce relaxation until the child learns how to relax consciously.

The use of mechano- or electro-therapeutic apparatus and other devices should be minimized. The fundamental principles of training are to educate nerve centers to perform the natural duties of those destroyed and to develop good habit patterns eliminating bizarre ones that may already be established. The closer the contact and the greater the cooperation between the patient and instructor, the greater is the likelihood of success. The birth injured show a definite increase in symp-

(*Continued on page* 222)

The Results of Multiple Binet Re-Testings of the Same Subjects

J. E. Wallace Wallin

PRIOR to 1909 psychological examinations played a minor role in the selection of children for the few classes for the mentally retarded that then existed in our public schools.[1] In most instances the selections were based primarily on the child's scholastic record, sometimes supplemented by the results of medical examinations. A few common sense tests, and the simpler tests familiar to psychological laboratories were, no doubt, toyed with, but the sum total testing was negligible before the Vineland revision of the Binet scale in 1911. However, following the appearance of the Vineland publications, intelligence testing in the United States spread like wildfire. Within a few years thirty thousand copies of Vineland Binet manuals had been distributed. Although the enormous spread of the scale was due partly to the exaggerations promulgated regarding its unerring accuracy and its complete adequacy for the diagnosis of mental defectiveness, it was also attributable to the fact that the scale met a genuine need better than had ever been done before, namely, the need for a simple, practical, easily administered, standardized, objective scale of tests for the measurement in understandable terms of levels of intelligence and degrees of intellectual deviation.

J. E. Wallace Wallin

In spite of the numerous criticisms lodged against it during the three decades in which its various revisions have been in constant use, it probably is correct to say that the Binet scale has been used more frequently than all other clinical tests of intelligence combined. The continued popularity of the scale, whatever its theoretical shortcomings and practical imperfec-

[1] The pioneer special classes for mentally deficient or retarded children were established in the following cities: Providence, Rhode Island, 1896; Springfield, Massachusetts, 1897; Chicago, Illinois, 1898; Boston, Massachusetts, 1899; New York, New York, 1900; Philadelphia, Pennsylvania, 1901; Los Angeles, California, 1902; Detroit, Michigan and Elgin, Illinois, 1903; Trenton, New Jersey, 1905; Washington, D. C., Bridgeport, Connecticut, Newton, Massachusetts, and Rochester, New York, 1906; St. Louis, Missouri, Indianapolis, Indiana, Passaic, New Jersey, New Britain, Connecticut, and Saginaw, Michigan, 1907; and Milwaukee, Wisconsin, Reading, Pennsylvania, and Houston, Texas, 1908.

• J. E. WALLACE WALLIN, PH. D., is director of the Division of Special Education and Mental Hygiene, Delaware Department of Public Instruction. The accompanying article is a condensed version of a paper he read at the Detroit meeting of the International Council in 1939.

Having been a pioneer in the field of special education, he introduced in the early days many innovations that are now taken for granted. He is the author of numerous articles and books, the latest book being, *Minor Mental Maladjustments in Normal People;* by Duke University Press, Durham, North Carolina.

Dr. Wallin is a member of the Journal's advisory board.

tions, is attested by the fact that two American revisions have appeared within the last two years, neither of which marks any basic reconstruction.

On the other hand, the most recent criticisms by the Iowa Child Welfare Research Station workers are as challenging as any that have been leveled against the scale during its entire history, although the assault on the scale itself is implicit rather than direct and perhaps less affects its fundamental structure than the uses made of its results. These investigators' "pessimistic commentary on the value of intelligence tests" seems to lead inescapably to the conclusion that a Binet IQ affords a reliable measure of intelligence only at the time the test is given and possesses no prognostic value as a measure of inherent or constitutional endowment. It affords a measure of environmental stimulation rather than of native ability. To quote: "The IQ of a child at a given age does not necessarily tell us what his future IQ will be or what his past IQ was." "There is now no escape from the fact that the IQ's of children have possibilities of change over a large portion of the IQ range from genius to feeble-mindedness. Children can and do change in test IQ from average to genius and from average to feeble-mindedness," depending upon the stimulating or non-stimulating character of the environment. Instances are cited by the investigators of Binet IQ's that increased from 98 to 167, an increase of 69 IQ's due to "attendance at preschool and enrollment in an unusually stimulating elementary school," and which decreased from 103 to 60, a loss of 43 points due to an "unfavorable environment . . . . . in an orphanage where almost no individual attention was given the children, where as many as 35 children were housed in one cottage with an untrained matron in charge, where play materials were not available, where contact with ordinary life situations was at a minimum."[2] These startling conclusions regarding the possibilities of education may give pause to many special educationalists and clinical psychologists, particularly those that have excluded entirely from the benefits of public education children adjudged ineducable because they fall below an IQ of 50. On the other hand, the conclusions may arouse the skepticism, not to say the undisguised hostility, of the host of workers that have striven to provide mentally retarded children with the best possible educational facilities that modern school systems afford but that have never been able, figuratively speaking, to transform sow's ears into silken purses. And yet, these are carefully considered deductions from an elaborate and apparently well controlled experiment on young children of various levels of ability.

For a long time we have given lip service to the concept of feeble-mindedness from social isolation but, practically, the concept has remained a dead letter. The majority of specialists on mental defect do not even men-

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[2] WELLMAN, BETH L., "Our Changing Concept of Intelligence," *Journal of Consulting Psychology*, 97-107, 1938. See also WELLMAN, BETH L., "Mental Growth from Preschool to College", *The Journal of Experimental Edution*, 127-138, 1937. SKEELS, HAROLD M., "Mental Development of Children in Foster Homes", *Journal of Consulting Psychology*, 33-43, 1938. SKEELS, HAROLD M.; UPDEGRAFF, RUTH; WELLMAN, BETH L.; and WILLIAMS, HAROLD M.; "A Study of Environmental Stimulation." (An Orphanage Preschool Project), University of Iowa Studies, XV, No. 4, 1938.

tion the possibility of mental defectiveness through social deprivation. Apparently the assumption has been accepted that environments so lacking in intellectual stimulation as to produce feeble-mindedness do not exist on the reality plane in this country or that feeble-mindedness engendered by a socially impoverished environment is a myth. Of many thousands of cases passing through the writer's clinics only four instances of serious mental retardation now come to mind that were ascribed purely to mental or educational neglect.

Two unschooled sisters, who had been put to work in a mill in Florida at the age of six, were brought by a religious organization to Pittsburgh at the ages of 10 and 14 for an education, and placed in a child welfare home. While testing mentally deficient, they did not present quite the symptom complex of the mental defective. The same can be said of a 19-year old boy from the same state with a Binet level of about nine, who was diagnosed as a case of mental defect through cerebral atrophy superinduced by social and educational neglect; and of a 15-year old girl, also without any schooling, from a backwoods mountain section in West Virginia. None of these would rate below the high grade defective or borderline level. Although few authorities have made any use of this concept, we are now told by the Iowa investigators that whether children of the same initial IQ are destined for feeble-mindedness or for genius depends almost solely upon the character of the environmental stimulation to which they are subjected. I can see in my fancy many an incredulous Thomas shaking his head and protesting vociferously that he cannot accept the conclusion that the environment is omnipotent in the development of intelligence and that heredity counts for naught. Let us hope that such a doubter will some day repeat the Iowa experiment for purposes of verification. Certainly the Iowa findings if verifiable are of transcendent importance for education so far as their implications are concerned.

With these preliminary remarks as a background, let us now turn our attention to an investigation made by the author, which is the main purpose of this paper.

DESCRIPTION OF THE INVESTIGATION

The investigation to be described is believed to be unique, (1) because it is based on the largest known number of Binet tests to have been periodically administered to the same subjects, and (2) because they were all administered by the same person.

In the administration of the Binet scale, the wide range method of testing was employed. The extent of the testing during any sitting was determined by the nature of the performance in the upper year-levels.

In addition to the Binet, the examinations included the more or less frequent administration of the Sequin form board, and Healy A and Healy B form boards, the Wallin peg boards, and certain anthropometric measurements (height, weight, spirometry, manuometry, and cephalmetry). In addition to the test, a large number of observations were recorded, mostly by the mother, particularly during the first few years of life, of many behavior characteristics. These observations were not made under highly controlled laboratory conditions, nevertheless, they possess a certain advantage in that they record happenings in

relatively free life situations in a normal home environment.

RESULTS

Many striking similarities and certain striking differences stand out in the records of these two siblings. The older one is spare, tends toward introversion, is somewhat inhibited and emotionally restrained, and does not tend to be a free mixer; while the younger one is stout, tends toward extroversion, is effusive emotionally, and readily establishes social contacts.

SIMILARITIES IN TEST FINDINGS

Surprisingly, the average IQ for the entire series of semi-annual Stanford-Binet testings based on age 14 as the highest divisor is 116.3 for A and 117.1 for B, a negligible superiority of 0.8 IQ for B. This is based on the average of all the tests from ages three to 16 for A, the senior sibling, who at 16 had successfully performed all the tests, except the XVIII-year forward digits test, and from ages three to 17 for B, who at 17 had completed all the tests except the forward digits test. On the other hand, on the basis of the use of age 16 as the highest divisor, A's average IQ is 114.8 and B's 114.3, a negligible superiority of 0.5 IQ for A.

Is this amazing similarity due to the sameness of the original germ plasm? Or to the sameness of the external physical and social environmental stimulations? Or to an equivalent concurrent action of both variables? While these subjects grew up in the same parental home except for the absence of B during the first four years of A's life, that does not necessarily insure the same psychic climate or the same subjective experiences. On the other hand, all of the eight schools attended by A during the testing period were different from the seven schools attended by B, with one exception. Only three of the schools were parts of the same school systems. Of their numerous teachers only one came into direct teaching contact with both girls. But in spite of the vicissitudes in school and teacher backgrounds, whatever the differences may have been, the average IQ's for the entire series of tests are practically identical.

Does the similarity of the IQ's in spite of the differences in the school backgrounds constitute an argument in favor of the dominant role of native endowment so far as intelligence is concerned? Or does it prove the dominance of the joint role of gene heredity and home environment? Does it indicate that the difference in the schools were negligible as compared with the joint force of heredity and home backgrounds? Or were the differences between the schools so slight as to be negligible?

DIFFERENCES IN TEST FINDINGS

But the test performance of these siblings is not alike in all respects. A detailed analysis of the results presents strikingly curious differences in the two Binetgraphs. An interesting spectacle is presented of fluctuations of mental development that occur at different age levels. In the earlier part of the century the literature on mental development was replete with references to plateaus and spurts in the curve of mental growth with little reference, however, to actual losses or deteriorations in the case of normal children. More recently some writers have concluded from Binet measurements that these assumptions are mythical. They affirm that the curve of mental growth is essentially smooth

or uniform in character. But our Binet data show that A suffered losses in IQ in 10 ages in the semi-annual series, varying from 2 to 9 IQ points. In the case of B, 13 losses occur. While the losses do not differ greatly for the two subjects, the largest and smallest losses occur at different ages. Inasmuch as losses occur at corresponding ages in only 7 instances, they apparently cannot be due solely to certain peculiarities in the measuring scale.

On the other hand, the drops in the Binet IQ are not paralleled in the case of either subject by appreciable losses in the same ages in the Seguin curve except in one or two ages.

Before seeking an explanation for these discordancies in the two intelligence growth curves as determined by Binet measurements, let us direct attention to an even more curious phenomenon of seesawing in the two records. In the series of semi-annual tests, A's IQ's are higher than B's in 13 ages, lower in 11 ages, and equal in one age—age 8. A's superiority varies from 2 to 12 points and B's from 1 to 14. But the most anomalous phenomenon in the shifts is that B is consistently superior to A in Binet performance in the early stages, then A forges ahead, then B takes the lead, and finally A comes out in front and retains her position of leadership.

Apparently if practice from repeated retesting, at six months' intervals, affects performance in the Binet test, the effect of such practice is not uniform for these two subjects, unless the assumption is entertained that other factors may have distorted the practice effects.

With respect to these anomalous shifts in the relative ability of the two subjects and the stagnations, retardations, and accelerations manifest in both Binet records, two questions merit careful consideration. First, what about the validity of the apparent shifts in the relative ability of the two siblings during the successive life periods? Is there any corroborative evidence that they are genuine? Is the shifting status paralleled in the psychomotor tests or in the development schedules based on the observation of behavior reactions? Second, do the developmental data or other available criteria explain the asymmetries in the two Binet curves of development?

So far as concerns the results of the psychomotor tests, the correlation between the fluctuations of the Binet performance of the two subjects and their peg board, Sequin, and Healy A and B performances seems to be rather negative or at least ambiguous.

With respect to the record of growth and behavior characteristics the data, taken all in all, seem clearly to corroborate the Binet verdict regarding B's superiority during early childhood.

In two things A is clearly in the lead during this infantile and post infantile period, namely, in the age of appearance of the deciduous teeth and in reading ability. Here is another anomaly in the two records. Why should A forge ahead in dental development during the period in which B's development was ahead in most other respects, particularly in view of the fact that B received more attention from pediatricians and did not experience the dietary difficulties that A did? It has been held that a correspondence exists between dentition and carpal development and that carpal development affords a reliable index of both physiological and mental

maturity. Our siblings thus present evidences of discrepancy between the stages of anatomical and psychological maturity.

Unfortunately most of the above comparative data from tests and observations are limited to the first few years of life, particularly the first two when the difference in the Binet is less marked than during later years. Few systematically recorded data for the later years are available except school marks; and as everyone knows, school grades are not very reliable criteria of either intellectual ability or scholastic proficiency. The difference in their school marks, however, is not striking.

EXPLANATION OF FLUCTUATIONS IN BINET'S IQ'S

In attempting to discover the causes for the fluctuations in the Binet curves —the factors responsible for the retardations and accelerations—one must consider both endogenous and exogenous factors. So far as retardations or losses in IQ are concerned, one might look for resistances, emotional upsets, distraction, fear of the examiner, dislike for the tests, lack of intellectual stimulation in the subject's ordinary social and intellectual environment, illnesses, and injuries. He might look also for defects in the tests as concerns their construction, standardization, and method of scoring and administration. Furthermore it is conceivable that arrests or even deteriorations in development might be primarily occasioned by ill-defined hereditary or constitutional factors. Irregularities in the strength of the hereditary propulsion, the growth impulse, or constitutional drives have perhaps more frequently been suggested in explanation of spurts of development. Other possible explanations of accelerations in intellectual growth would include improved physical health, a stimulating social and educational environment, freedom from hampering conflicts, fears, and anxieties. It is also obvious, of course, that defects in the measuring instrument might produce spurious fluctuations upward as well as downward.

Are there any data at hand to enable us adequately to explain at least the more marked fluctuations that occur in the records of these two examinees? Let us turn first to the records of colds, influenza, childhood infections, other illnesses, falls, and injuries. A minute analysis of the data permits only very guarded or tentative conclusions. To illustrate: One month after an attack of chicken pox at 8-9, A shows a gain of 2 IQ's from a low score of 108 IQ's followed by another gain of 2 IQ's six months later, although she had had an attack of influenza lasting a week and a half two weeks before the latter test and was very restless during the test. On the other hand, B's IQ obtained at the time she had the chicken pox at 4-6 fell 5 points. Eight months later she lost 4 more points after an attack of mumps. One year and two months later at the age of 6-4 she had her tonsils removed. The Binet test two months later yielded the lowest IQ, 109, up to that time. However, eight months after the operation the IQ had advanced to 121, the highest point reached up to that time. On the other hand, while the removal of A's tonsils at 4-8 was followed by a gain of 5 IQ's in the test four months later, the gain was followed by a slow recession that continued for several years with several fluctuations and that reached a low point of 108 at 8-6. These results do not supply incontestable evidence either for or against the

hypothesis that Binet retardations can be explained by fluctuations in the physical condition of the subjects. The possibility that the fluctuations might be due to the coarseness of the measuring instrument should be given due consideration before too much emphasis is placed on factors extraneous to the scale.

What does the record of physical injuries show? Most of the falls and injuries suffered by both subjects occurred in early life and were minor ones so far as can be inferred from the record. Of course, it is recognized that accidents that appear to be trivial from the standpoint of the psychic trauma produced, of which the observer may be unaware, may continue subtly to color the individual's mental reactions for years. A suffered a severe jolt at 34 months from hurtling through a window when the screen became loosened. She plunged one story to the concrete pavement below, landing on her thigh. Her Binet IQ two months later was the lowest in her entire series of tests. One cannot conclude unqualifiedly, however, that this physical shock was solely responsible for the low IQ. Her low IQ in early life, if due to injury, may have been the resultant of the cumulative effect of numerous falls. During the first year she had a record of ten falls as compared with three for B. On the other hand, the record of colds, fevers, childhood infections, and illnesses does not differ greatly for the two subjects.

The supposition is probably correct that inattention and restlessness during the test constitute one of the endogenous sources of IQ losses. But our records show that this result does not necessarily follow. At the age of 3-0 A was restless during the test and scored her lowest IQ. At 3-6 she exercised better control and made an IQ of 114. But at 4-0, although she gave good attention and was not restless, her IQ fell to 108. On the other hand, at 4-6, although she was constantly fumbling with her hands and her attention was constantly wandering, her IQ rose to 115. Likewise B at 3-6 was very restless and impatient to get to her kitty, but in that test she secured one of her highest IQ's, 124. In later adolescence she became rather resistant to the testing ordeal, partly because she had grown rather bored with the tests and partly because the testing interfered with her interest in other pursuits. This apparent apathy may have been a factor in her declining IQ's during part of this period, but it would be speculative to assert that the antithetical condition fully accounts for the spurts that occurred.

The attempt to explain the numerous spurts that occur in the two curves is even more difficult than the attempt to account for the losses. To cite a few specific situations: There is nothing in the record to explain A's large IQ spurts from age 11-6 to 12 (amounting to 10 IQ's), from 3 to 3-6 (amounting to 8 IQ's), or from 4½ to 6 (amounting to 4 IQ's). In the last instance she had a tonsillectomy at 4-8, but the spurt apparently started at 4-6 before the tonsils were removed. The literature on the results of the orthogenic effects of the removal of physical handicaps teems with contradictory findings. Even granting that B's large gain from 6-6 to 7 (12 IQ's) is explained by her tonsillectomy, there is nothing in the record to account for the large gains from 11 to 11½ (7 IQ's) or from 12 to 13 (7 IQ's or 24 months). Since the spurts occur at different ages for the two sub-

jects, just as do the losses, it would appear to be rather gratuitous to attribute them to hypothetical changes in the stimulation of the home environment. Nevertheless, in spite of the hypothetical similarity of environmental opportunity, however important or unimportant this factor may have been, marked fluctuations in the IQ curve did occur at non-corresponding points. But let us turn from these hypotheses to the consideration of another possible explanation of the fluctuations in the Binet curve that has been relatively disregarded in the literature; namely, imperfections in the scale itself.

IMPERFECTIONS IN BINET TEST CONSTRUCTION AND SCORING

We should remind ourselves that the Stanford-Binet Scale contains not only so-called power tests, but also tests of information or erudition the successful performance of which is dependent solely or largely upon experience or learning. It is obvious, therefore, that the results of instruction will be reflected in Binet performance. Again, nearly all of the tests are scored on the all-or-none principle although the responses to some tests cannot fairly be scored as all wrong or all right. No matter how well trained or experienced the Binet examiner may be, he is always confronted with the problem of scoring borderline responses. Now, it is apparent that if the examinee is marked minus on borderline responses that are very near the passing standard, a later test may produce a spurious spurt, for he would be credited with an advance of from two to six months (or even nine months in the abbreviated scale) depending on the location of such tests, although the progress made may be very slight and would not represent such a gain.

Another possible explanation of spurious fluctuations in the Binet IQ curve relates to the extent of the testing. If the testing is not equally complete during each successive test, the losses and gains might be due to the inequalities in the range of the testing. The importance of wide range Binet testing is shown by an experiment in 1916 in which the 1908 Binet scale was used with children of various intelligence levels. When a wide-range method of Binet testing was employed (in which the number of advance tests given averaged 4.5 tests more than the number given in a narrow-range method) on an unselected group, "the average amount of extra credit earned . . . . . amounted to three-fourths of a year or more" in most of the Binet ages. "In one age it amounted to a year and a half."[3] In the same connection, the inadvertent omission of a test might readily become a factor irrespective of whether the narrow-range or the wide-range methods of test administration is employed. Many instances of such inadvertence have been discovered in the inspection of the record blanks of examiners in our clinic files.

The above discussion will suffice, it is believed, to render the hypothesis plausible that the extent of fluctuations in the Binet test scores from test to test are often exaggerated because of the equivocal or ambiguous nature of the responses or because of imperfections and uncertainties of scoring. If this is correct, some of the conclusions reached regarding the ex-

[3] WALLIN, J. E. W., "Wide Range Versus Narrow Range Binet-Simon Testing," *The Journal of Delinquency*, 315-330, 1917.

tent of the transformation of the IQ's in either direction produced by environmental stimuli are exaggerations. Exaggerated increases in test ratings might be produced by the examiner's favorable anticipations. Because of his favorable mind-set, borderline responses are given the benefit of the doubt and accorded full credit. On the other hand, an unfavorable attitude induced by unfavorable environmental situations might be unconsciously reflected in a hypercritical treatment of borderline responses, in consequence of which such responses are scored minus. An unconscious attitudinal bias in either direction toward borderline responses might produce considerable shifts in the IQ's in records containing many such responses. In reply to this assumption it might be argued that the effects of a good or poor environment are reflected not only in linguistic or verbal tests, such as the Binet, but also just as notably in performance tests, such as the Merrill-Palmer (as reported in the Iowa experiment), which are free from questionable responses. The reply is two-fold: First, the scoring of performance tests may also present difficulties. The scoring often cannot be done purely mechanically. Many motor performances come within the borderline region of passing and the scoring can be tipped in the direction of the conscious or unconscious bias of the examiner. Second, the results of experimental studies on this point are discrepant. Thus Gaw's study of neglected canal boat children (who attended school only 5 per cent of the time) in England showed an IQ of 82 in the performance tests as against an IQ of only 69 in the Binet. Here the impoverished environment affected the Binet rating more than the motor rating in contrast with the Iowa finding.

CONCLUSIONS

This presentation of findings will be concluded with two brief comments, the one largely theoretical in character and the other practical in its implications.

1. What is involved in the concept of fluctuations or variations of intelligence? What do the fluctuations postulate? What is the nature of this abstraction that we denominate intelligence that is subject to fluctuations? Is the underlying *thing-in-itself*, the basic substrate or energy that expresses itself in intellectual functioning a fixed, static quantum, or is it a constantly changing force? Is the underlying strength of intelligence uniform or is it fluctuating?

Let us say forthright that the only phase of intelligence open to test exploration is that which functions in test situations or which can be observed in overt behavioral reactions. We may refer to this as the phenomenal and knowable aspect of intelligence and personality as opposed to the noumenal self which, whatever it may be, is inaccessible to the examiner. To assert that fluctuations as evidenced in test findings are paralleled by corresponding fluctuations in the underlying reality to which we popularly apply the term intelligence may be true, but it would constitute a speculative leap in the dark, and would raise questions that had better be reversed for the metaphysician. After all, the psychological examiner is able to measure only the psychophysical reactions of the organism and his conclusions should be limited to observable phenomena. It is conceivable that the reactions or responses

of the organism might be greatly interfered with or might be greatly facilitated by organic and extraorganic conditions without producing fundamental modifications in the underlying intellectual energy. To conclude from test findings, even though they have been adequately documented and are not spurious because of the imperfections in the tests or in the rating techniques or for other reasons, that one individual's intellect has improved 50 IQ points or deteriorated 50 IQ points may represent an inductive leap beyond the premises. All that the deterioration revealed by the tests may mean is that the outlets of expression have been impaired or blocked by obstructions, temporary or otherwise. IQ gains might likewise be due to facilitations or excitations of the neuromuscular apparatus.

All this aside, however, it is indisputable that fluctuations do occur whether the children are normal or abnormal, whether the retests are given by the same or different examiners, or whether the retests are given infrequently or in a long series of retests at six months' intervals. These fluctuations may be genuine or illusory. They may be partly correct and partly misleading. They may be exaggerated or minimized by the testing or scoring techniques. They may be caused by endogenous or exogenous factors. They may represent the effects of practice or of emotion inhibitions. They may be permanent or temporary. They may be subject to remediation or they may prove to be highly resistant to modification. Broad diagnostic and prognostic generalizations should, therefore, not be ventured in clinical work without a careful consideration of all the factors, external and internal, that affect responses to psychological tests of whatever nature. In other words, psychological diagnosis and prognosis should be based upon the thoroughgoing application of case-study procedures. In such procedures the use of standardized psychological tests, whatever their limitations, is of basic importance.

2. The practical bearing of all this is that inferences from test findings regarding a child's intellectual ability should not be hastily reached. Although the IQ in general may be fairly reliable, and although it is perhaps the most valuable single measure we possess of relative intelligence, after all it is only one factor in mental diagnosis. In a sense, an IQ is merely an X to be interpreted in the light of all the synoptic findings bearing on the case. Viewed in isolation, it may become little better than a cryptic symbol and a source of confusion. Let us, therefore, emphasize that classifications and assignments should be tentative, and subject to revision in the light of a fuller knowledge of the examinee.

It is particularly important that the classroom teacher should be freed from doctrinaire and fallacious ideas regarding the inerrancy of IQ as well as of all other kinds of Q's. Always the teacher and the educator should give the child the benefit of the doubt. An IQ should never serve as an excuse for complacency or justification for inaction. Ample opportunities should be afforded young retardates and deficients in the literary subjects, using the best remedial techniques, concrete procedures, and interest-provoking activity programs, before such instruction is abandoned and the emphasis diverted to motor training.

Doubtless, many young children have been institutionalized as feeble-minded

and thereafter retained permanently in institutions for such children who would have improved in a superior public school environment. On the other hand, many young children have been excluded from public school special classes on the basis of an arbitrary IQ standard, usually a Binet IQ of 50 and below, who would have made reasonable progress in such classes. The writer has known many cases in point with IQ's below 50 who have made greater progress than others with IQ's in the fifties or sixties, either because they possessed counterbalancing personality traits of greater value than the IQ or because the IQ was spuriously low as proved by the children's subsequent development.

The writer has for many years felt that too many children are being sent to residential institutions for the feeble-minded where they may receive inadequate instruction because of the crowded conditions or because of substandard instruction and where the institutional life tends to make against the development of initiative, resourcefulness, or independence. If the Iowa results mean anything, even after you have discounted the possible exaggerations, they mean this, that young children, whether they test normal or subnormal, should not be regimented into a form of congregate existence that is barren of cultural and intellectual stimulation. It is no doubt true that many institutions afford not only better shelter but also better social and intellectual stimulation than many impoverished and incompetent homes. But the truth remains, nevertheless, that a good home is superior to a good institution in the intellectual stimulation and personality development of subnormal as well as normal children, at least if the children are above the level of feeble-mindedness. The first line of attack in the education of subnormals is the public schools rather than the colonies. Even children with IQ's below 50 should not be arbitrarily denied the advantages of the special classes without an adequate period of probation. Without adequate environmental stimulation potentialities have no chance to develop. Therefore, the child is entitled to a reasonable trial before irrevocable decisions are reached concerning his future. Residential institutions play a very important role in the program for salvaging mentally defective children, but they should not usurp the function of the public school nor should the public schools force children into these institutions so that they may justify themselves in shirking their responsibilities toward "all the children of all the people." Public school officials exist who are perfectly willing to be relieved of the responsibility for educating defectives. What, then, should be the prime function of the residential training schools so far as concerns the education of mentally defective children? The institutions should play the role of auxiliary training schools for idiots and low imbeciles and for mentally defective children that are already anti-social or delinquently or criminalistically inclined, who are unprotected or unsupported or who make too great demands on an overworked mother or who are victims of educational neglect because the public schools cannot or will not cater to their needs.

One final reflection on the writer's credo, based on experience with thousands of defectives, concerning the effects of environmental stimulation. Environmental stimulation is of paramount importance in bringing intellec-

tual potentialities to fruition. Without it intellectual atrophy would inevitably result: intelligence cannot flourish in a vacuum. Nevertheless, neither the physical nor cultural environment is omnipotent. Native endowment sets insuperable limits so far as concerns the development of intelligence. Constitutional limits exist that not even a superior environment can completely overcome. Therefore, the impression should not be allowed to gain currency that a superior environment will transform all mediocre children into geniuses, or that a barren environment will reduce all such children to the state of amentia. While the transformation wrought by education often looks like the creation of new powers, education perhaps only facilitates the unfoldment of existent latent powers. In the complete absence of potentialities to be released and unfolded, education is as impotent as the fruition of potentialities in a vacuo. Nevertheless, after conceding all this, we must recognize that the limits set by gene inheritance are not as rigidly fixed as was once believed. Without a favorable social and educational environment, many who have attained eminence would have remained mediocre. Education is a constructive force no less for potential morons than for potential geniuses.

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Spasticity

(*Continued from page* 210)

toms in the presence of distracting noise or stimuli, therefore, apparatus breaking the closeness between the two is a hindrance. Exercises have been done in water which must be 100 degrees Fahrenheit to cause relaxation and to prevent contraction from chill. Hot water is an artificial form of producing relaxation, however, and it should not be relied upon to give permanent results. Roller skates have been placed under the legs and at right angles to them with the patient lying prone to bring about freer motion. Slings hung from an overhead bar are also sometimes used. Ultra violet rays increase muscle tone. Since spastics already have a hypertonic muscular condition, undue exposure is inadvisable. This is also true for an overdosage of sunlight, especially in summer. Increase in muscle tone parallels approximately the amount of sun tan acquired which should be avoided as much as possible with a spastic patient.

The muscle re-education begins with the larger joints because those movements are simpler, and it is essential that the larger joints be under good control before the smaller joints are moved. Thus, a highly trained hand is of little use if the elbow and shoulder motions are not controlled. The motion must always be rhythmical and at first slow and of small range which can be increased when the reflex spasm can be avoided. The instructor can be trained with a metronome, but this is not to be used during the exercise period, for its sound is a disturbing stimulus. The child is conditioned to respond to a rhyme and the movement becomes automatic. Care must be taken to be sure the motion is reciprocal so that the pulling force is not stronger in one direction than the other. Speed must also be the same for both directions.

Through the medium of muscle re-education the difficulties of these handicapped children can to a large degree be resolved. Although the remedial program for spactics is not an easy one to pursue, the patient and those working with him can look forward to a satisfying achievement.

Shall We Segregate Our Handicapped?

Lewis C. Martin

THE question of segregation has been discussed in most educational meetings in recent years with respect not only to physically handicapped but also to all types of exceptional children. The progressive education group is most critical of segregation. This attitude is in line with their emphasis on democracy and respect for human personality. They consider special schools for the mentally retarded or other types of handicapped children to be undemocratic. They are also of the opinion that segregation casts a stigma on the child that may be damaging to his best personality development to the extent of making him feel different and inferior to other children not thus handicapped.

Lewis C. Martin

EQUAL OPPORTUNITY

Democracy in education implies an equal educational opportunity for all; but, as has so often been stated by those working with the handicapped, it does not necessarily mean the same type of education for all children. It is probably better from the standpoint of a child's mental health to place him in a situation where he has a chance to succeed, even though it may mean segregating him in a group with similarly handicapped children.

As Rivlin says, 'Success in school reduces the emotional shock of failure, and is thereby a factor in achieving emotional adjustment."

The above author, in discussing the role of physical disability in school failure, says, "Physical disability impairs school proficiency by reducing the energies available for work and by interfering directly with learning. A pupil with an auditory defect may not hear all of the teacher's explanations, and the child with a spinal disorder may not be able to sit still long enough to master his assignments. A physical limitation handicaps the pupil in most of his classes, but may be particularly disabling in one or two subjects."

Here, Rivlin probably has in mind the child who is only partially handicapped; but, if the above is true of a child whose handicap is not serious enough to place him in a special class or school, how much more it is true of a child who has lost the greater portion of his vision or hearing or who is severely crippled or mentally retarded.

SATISFACTORY ADJUSTMENT

In order for the child to make a satisfactory adjustment, the school envir-

• LEWIS C. MARTIN, PH.D., a psychologist, is director of child study and special education for the Portland Public Schools, and is a member of the board of directors of the International Council for Exceptional Children. He received his Ph.D., from Vienna University and was awarded a Heilpudagogisches Diploma by the International Institute for the Study of Individual Psychology under Alfred Adler. His very broad teaching experience includes two years at the American College, Sofia, Bulgaria, and one year at Gurez Tepe College, Constantinople, Turkey.

onment must be adapted to the child's physical and mental limitations. The curriculum and methods must be adapted to the interest and ability level of the child. Mitchel, past president of the Clinical Section of the American Psychological Association, says that the school curriculum and its methods are adapted to the needs of only fifty per cent of our children. If that is true, is it any wonder that we have truancy, day-dreaming, neurotic ills, delinquencies, and other behavior reactions directly attributable to the school environment? It would seem in the light of this statement that a special school or class, where the work is adapted to the limitations or handicap of a child and where success follows a reasonable expenditure of effort, would be better from a mental hygiene standpoint than a regular school class, where the work is not adapted to the child's limitations and where, irrespective of effort, success is seldom attained.

In spite of the point of view of the progressive group previously mentioned, they agree that the *extreme* cases should be segregated. The writer asked a leader of the Progressive Education Association, what he meant by extreme cases. His answer was, "Children with IQ's below seventy are considered extreme cases." This would mean the segregation of one per cent or more of our school population on the basis of intelligence.

AWAY FROM SEGREGATION

At a recent meeting of the International Council for Exceptional Children, the writer conferred with some of the leading specialists in this field, and came to the conclusion that the trend was away from segregation. That is, instead of placing handicapped children in a building set apart from others, they are being cared for more and more in special classes in regular buildings where they take part of their work with normal children. In spite of this trend, it was the opinion of experts in the special education field that the best work was probably being done in those schools where the children are segregated.

WHY CHILDREN ARE SEGREGATED

There seem to be three principal reasons for this opinion, two of which are administrative in nature. The first is that the education of the exceptional child is the primary consideration of the staff of the school and not incidental to that of the normal child as is sometimes the case when a special class or classes are placed in a building for normal children. Such a building is not likely to have the special equipment and supplies necessary for accomplishing the best work with the handicapped child. The second reason is that in a special school the teaching staff is more apt to be selected because of an interest in and special training for handling a given type of child than would be the case if classes were scattered over the system in numerous schools. The third is an economic reason. It is not possible to use facilities as economically with classes in numerous schools as it is when they are brought together in one building.

It is not the intention to imply that the above must necessarily be true, but rather to present a condition that exists. If adequate equipment and well-trained teachers were provided, few educators would champion segregation for most of the major types of exceptional children.

TYPES MORE OFTEN SEGREGATED

There are three types of exceptional children who seem to be segregated

more often than others. The *first* is the delinquent child. These children, after having been placed in institutions, (the girls frequently being maternity cases) are segregated either for the protection of themselves or society. Therefore, they are of necessity special education problems.

The *second* type often segregated is the overaged, mentally retarded adolescent. While these children are usually more mature physically than the average high school pupil, they are not capable of doing regular high school work. Some school systems place these young people in buildings apart and develop a curriculum to meet their needs, usually including courses of a prevocational nature. Such a curriculum is rich in manipulative experiences particularly in the study of industrial and household arts. In order to have the shops and necessary shop equipment, segregation seems more practical. Many of these schools have woodworking, electrical, metal, auto repair, shoe and leather repair, and tailor shops for boys—cooking, sewing, commercial art, nursery training, and restaurant and cafeteria service courses for girls. It would be impossible to set up such courses unless a large enough enrollment could be assembled in one building to justify the expenditure.

This does not mean that it could not be done in centers in large regular high schools; in fact, that is what many cities are doing. In addition to the extreme cases, there are many pupils in the regular high schools who would profit more from a prevocational program with a modified curriculum in English, mathematics, science, and social studies than there are from the standard high school course.

Bulletin Number 7, Office of Education, Department of the Interior, states that 62 cities in 22 states reported the above type of school with 1,126 classes and 22,010 pupils enrolled. From these figures it is obvious that such schools are quite widespread.

The *third* type of child that is frequently set apart in separate school buildings is the crippled child. The above-mentioned bulletin reports 33 schools with 208 classes and an enrollment of 4,365 pupils. The tendency is for these special schools to be located in large city systems, whereas special classes are more often found in school systems not having enough crippled children to justify special schools. The number of classes in regular schools is 273 with an enrollment of 5,673. In addition to city-size, there are several other factors influencing such segregation. The fact that such a school requires so much in the way of special service and equipment makes it easier to centralize the work in one school. If orthopedic physicians, physiotherapists, nurses, and teachers of corrective gymnastics are provided, their time can be used more effectively when children are brought together in one school than when they are scattered over an entire school system in regular or special classes.

EQUIPMENT

The equipment needed for the above work, such as a solarium, pool for hydrotherapy treatments, physiotherapy tables and apparatus, could not be provided except for large groups unless a school system has unlimited funds.

PARENTS

The attitude of the parents is another factor in favor of segregation. Parents of crippled children sometimes

(*Continued on page* 237)

Public School Speech Clinic Rooms, Equipment, and Supplies

Clarence R. Van Dusen

WITH the increased awareness of the need for speech rehabilitation for children, there has come the establishment of speech clinics in the public schools. When a new speech center or clinic is established, one of the first questions asked is in regard to space and equipment.

The purpose of this report is to give detailed information on the most desirable location, size of room, and nature of special equipment and supplies necessary for use with pupils with defective speech and voice.

Information for this paper was furnished by members of a committee and other speech therapists in the State of Michigan.

Clarence R. Van Dusen

PERMANENT ROOM

Children are brought into the permanent room, and remain with the speech therapist throughout the day. This room serves as a *speech center* where recording device, audiometer, and other equipment are available to all teachers in the system.

LOCATION—The permanent room should be centrally located in the community. Within the building it should be near the kindergarten, first, second, and third grade rooms, preferably on the same floor as these rooms. It must be in a quiet part of the building near or adjoining auxiliary rooms.

SIZE—The speech correction classroom should be approximately 21 x 33 feet. There should be sufficient space for two or three groups to be working without confusion.

ROOM CONDITIONS—The room should be pleasant, light, airy, and well ventilated. Temperature should be kept between 70 and 72 degrees. It is also important that the room be made *home-like*.

SPECIAL FEATURES—Acoustics must be good, with no echo, and walls should be so constructed that sound will not be conducted from adjoining rooms.

CONDITIONS TO BE AVOIDED—The room should not be near lunch rooms, toilets, music rooms, gymnasium,

• CLARENCE R. VAN DUSEN, D. Sc., is director of the Speech Clinic of the Michigan State College, East Lansing. During preparation for his chosen work he majored in English, Speech, and General Linguistics, studying at Goshen College, Indiana, and at the universities of Iowa, Indiana, and Michigan.

Dr. Van Dusen is a member of the American Speech Correction Association, and of the National Association of Teachers of Speech, and is listed in America's Young Men (Volume III), and in Who's Who Among North American Authors.

The accompanying article is from a recent report submitted by the speech correction group of the committee on special-education, rooms, equipment, and materials of the Michigan Department of Public Instruction. Members of the speech-correction group were Caroline Z. Ormes, *chairman*, Flint; Irma T. Hiar, Lansing; Harvey H. Lowrey, Dearborn; Natalie Melby, Battle Creek; and Clarence R. Van Dusen, Michigan State College, East Lansing.

or other noisy parts of the building, and it should not be large or formal.

MAXIMUM NUMBER OF PUPILS PER ROOM—The maximum number enrolled as regular speech correction students should not exceed fifteen. With this arrangement, the teacher should be able to work individually with an additional fifteen children from other rooms.

REGULAR EQUIPMENT—Desks and chairs should be suited to the height of children enrolled, and should be movable. The amount of blackboard space should be the same as that in other elementary grades, and there should be a bulletin board for charts that record individual improvement.

SPECIAL INSTRUCTIONAL EQUIPMENT—A phonograph and records suitable for training in relaxation and rhythm are essential. Other important items are: a full-length mirror; four hand mirrors; scrap books; cut-out materials, old magazines; speech games; tools; consonant charts; vowel charts; speech jingle books; pictures; toys; tongue blades; metronome; colored crayons; paste; construction paper; and poetry and prose, suitable to various ages.

There are other pieces of equipment that are highly desirable but that are not included as minimum essentials. They are: a speech recording device and records, audiometer, and cots. In many places these items will be available in the school system, but the procuring of them from another room whenever they are needed takes time. Inasmuch as the speech therapist has no time to waste, it is highly desirable that they be at his or her immediate disposal.

ped office is not an absolute necessity

OFFICE EQUIPMENT AND SUPPLIES

OFFICE EQUIPMENT—A fully equipped office is not an absolute necessity to the speech therapist. It is highly desirable, however, because of the records that must be kept of each student.

Filing cabinets are an absolute necessity. There should be several drawers, letter size. Cabinets for filing small cards (4 x 6 or 3 x 5 inches) should be available. Dr. John H. Muyskens has pointed out: "Files for keeping records of the child's difficulty, appointments, and progress need not be elaborate. This is an aspect that is often overdone by zealous beginners, important as adequate records are."

OFFICE SUPPLIES — Office supplies should include the following: letter-size folders for case histories; 4 x 6 or 3 x 5 inches index cards; case history forms; psychological testing materials; speech testing materials; a few games, toys, pictures, and books; blanks for home calls; and enrollment cards.

AUXILIARY ROOMS

TEACHER'S OFFICE—The speech therapist's office is usually in one corner of the permanent room. This arrangement is not entirely undesirable but, since she must have many individual conferences with subjects from outside her permanent room, there is a need for an office adjoining her classroom. In schools where this is feasible, a room 12 x 12 feet with a glass partition between it and the classroom is highly desirable.

RELAXATION ROOM—The room for relaxation should be well ventilated and attractive. It should be in a part of the building where there is a minimum amount of noise, and should be equipped with cots or mats and blankets, and with shades at the windows.

LUNCH ROOM—Speech troubles are sometimes due to malnutrition. Supervision of diet makes the lunch room a highly desirable auxiliary room.

TEMPORARY ROOM

In systems where the speech therapist visits several schools, a temporary room will need be made available to her at each point of visitation. This should be within the building at some distance from the regular classrooms of students enrolled for speech rehabilitation. Size, conditions, equipment, and special features should be as similar as possible to those of the permanent room.

OFFICE OF TRAVELING TEACHER

The traveling teacher needs a private office. This will serve as a headquarters for equipment and supplies, and as a suitable place for interviews.

IN CONCLUSION

Elaborate equipment, as the reader has no doubt already concluded, is unnecessary for the majority of subjects receiving speech rehabilitation in the public schools.

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THE QUESTION IS, "WHAT DIFFERENCE DOES INTEREST MAKE?"

IN following the *interests* of children, extreme progressivism has made a real mistake. It has ignored both organic and cultural imperatives. What difference does it make whether a child is interested in protecting his body against bacteria? He must if he would live. What difference does it make whether he is interested in reading? He must be able to read in present-day America.

DR. LLOYD COOK
The Ohio State University
Columbus, Ohio

WE GET WHAT WE PAY FOR

MANY teachers are so emotionally impoverished themselves they are not reliable guides for children along emotional pathways. They have become so used to the boredom of the average classroom, they have even learned to like it.

DEAN GEORGE D. STODDARD,
University of Iowa.

NEWS AND COMMENTS

Easter Seal Time

BECAUSE of the encouraging yearly increase in the receipts from the Easter Seal sale, Easter time is coming to mean more and more to crippled children. During the past six years each succeeding sale has grown larger, not only in funds realized but also in public recognition. Convincing, tangible proof of the spread of the movement lies in the fact that this year will see some thirty odd states in participation, a far cry from the scattered few that took part in the first annual seal sale of 1934.

The reasons for this growth are not hard to understand. The cause of the crippled child is as appealing as any could be, a fact which in itself means much. But the unceasing effort of the National Society for Crippled Children on behalf of this country's some 350,000 crippled children must receive the great part of the credit for the progress made. Most important of its acts has, of course, been that of providing the country with its first systematic, annual, dignified, and adequate means of financing crippled children's work. In this connection, too, it has continued the organization of state agencies with their local branches, by means of which the seal sale is facilitated and spread. It has been untiring in its effort to encourage local and national legislation dealing with the welfare of cripples. At present it is sponsoring the Pepper-Boland Bill. It is hoped that the next session of Congress will bring the enactment of the bill, which has to do with special education for physically handicapped children. Not the least of the accomplishments of the National Society is a fast growing Bureau of Information, a clearing house of material valuable to social workers—nurses, physical and occupational therapists, the medical and surgical professions, educators, rehabilitation personnel, and laymen interested in the field of crippled children's work.

In brief, ten important phases of the National Society's work are:

1. Discovery, enumeration, and registration of every crippled child in each state.
2. Diagnosis of the ailment at clinics, and early hospital care and medical treatment.
3. Arrangement for proper medical and physiological convalescent care.
4. Development of educational facilities to insure every crippled child an education.
5. Securing vocational training for those able to work, and homebound vocational training for those who must work under sheltered conditions.
6. Assistance in securing vocational placement and self-supporting employment compatible with the handicapped person's capacities—mental and physical.
7. Prevention of the causes of crippling.

8. Enactment of legislation to further this program in each state.
9. Fostering recreation—camps, playgrounds, Scouting, and so forth.
10. Cooperation with state and federal departments and all other private and public agencies.

The National Society annually conducts a ten-day training school for workers in the field of the physically handicapped. This course, something entirely new, offers instruction in each of the ten phases of the work outlined above. The need for such training is great; and the National Society is singularly qualified to fill the need.

The presence of the Easter season means that the seventh annual Easter Seal sale is at hand. Seals will be on sale this year from February 24 to March 24.

—CONTRIBUTED

New Aids for Sight Saving Students

IN the Buffalo public schools, under the direction of Mr. R. Pratt Krull, associate superintendent in charge of Extension Education, and with the help of the National Youth Administration and our Department of Secondary Education, books are being transcribed, and other aids developed for sight saving high school students.

For the past ten years we have typed material, which has been used in loose-leaf note books; but now a new duplicating machine purchased by the Board of Education, enables us to do this work in sufficient quantities to make possible the transcribing of complete books. Thus far we have made twenty-eight copies each of *Macbeth* and *Hamlet;* twenty-nine copies of an abridgment of *English in Action* by J. C. Tressler; and twenty-five copies of *Elements of Business Training* by Brewer, Hurlbut, and Caseman. At present we are at work on a history of English literature. The books are transcribed in 18-point Caslon type.

To assist smaller communities that cannot afford a machine such as we have, a copy of each transcription is being given to Miss Matie Carter, state supervisor, and one to the New York State Traveling Library.

Because all teachers do not use the same text, the aim in making these abridgments has been to select such parts as would be identical in all textbooks, and to omit illustrations and development work that would vary in different schools and with different teachers. For example the rules for capitalization, punctuation, and grammar are the same in any text. No matter what book he uses, the student must learn to begin the first word in each sentence with a capital letter. The means used to make this point clear vary with authors and teachers, therefore, we have copied the rules and omitted almost all of the illustrations. We have also copied the practice exercises, which the teacher can easily correct even though another text book is used by the class as a whole.

Physics drawings, general science drawings, and all the figures in plane and solid geometry have been enlarged. These drawings will be bound into a pamphlet and when other students work from drawings in the textbook or on the blackboard, our students will use these sheets.

The boys in the printing course at Burgard Vocational High School are printing in 24-point Tempo Type, an abridgment of *Twentieth Century Typewriting.* This is a very large and difficult undertaking that will require at least a year for completion. The

quality of the work, however, is such that we have seen no better from any commercial press, and we believe it will be of inestimable value to sight saving students when completed.

In our high schools we do not, for obvious reasons, have sight saving classes; but the work of each student is individually directed and special adaptations are made. Even to have sight saving desks is, in most instances, impracticable; because to make adequate provision we should need five desks for each student, one in each of his classrooms. Our students are permitted to go to the typewriting rooms at any time to prepare written assignments, and much of their work is read to them; yet it is sometimes necessary for them to do a limited amount of writing in the classroom. If they use the regular classroom equipment, it is impossible for many of our students to maintain correct posture for writing. To overcome this difficulty Mr. Hoole, principal, and Mr. Hull, machine shop instructor at McKinley Vocational High School are working on an adjustable rack that can be folded and that will be light enough to carry about from room to room.

It is evident that in other school systems the need for more large type books and other material for advanced sight saving students has been recognized, and it is hoped that this news item may stimulate the thought of others who are transcribing books to assist toward the formulation of a plan of exchange whereby each group may benefit by the work of all the others. The method of duplication that we are using permits us to make two hundred copies from one writing. The resources of all interested groups could be greatly increased if, for instance, twenty-five copies of *Hamlet* could be exchanged for twenty-five copies of *Idylls of the King*, or several copies of *English in Action* for an equal number of a French text. The difficulty of obtaining permission from the copyright owners has been mentioned, but we have found the publishers very willing to cooperate. They would, of course, want to know the exact number of copies to be exchanged, and with whom, but it seems to me this should not be an insurmountable difficulty. Why could not a project be started by the United States Office of Education and workers be assigned to each city wishing to cooperate? Regulations could then be formulated as to the quality of paper to be used, the titles of books to be transcribed, the type of duplication, the kind of binding, and the basis for exchange. Perhaps if even two or three cities had the courage to undertake such a project, from that humble beginning there might ultimately evolve a Federal Sight Saving Printing House.

STELLA J. QUATTLANDER,
sight saving and braille advisory teacher,
Buffalo Public High Schools,
New York

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Report on Indiana University Traveling Speech and Hearing Clinic

The Indiana University Traveling Speech and Hearing Clinic, under the direction of Dr. Robert L. Milisen, has completed a year and a half of its two-year clinic in the public schools of Indiana. During the nine-month period of last year, over 66,000 persons were contacted by the clinic, counting children tested and teachers and other adults given demonstrations and lectures. The unit was sponsored by the Psi Iota Xi national sorority which

granted $10,000, supplemented by funds from the extension division of the university.

The clinic is divided into two parts. The speech section is staffed by a supervisor, Miss Vivian Roe; a speech correctionist, Mr. Francis Sonday; and a psychologist, Miss Florence Woods. The speech staff open a clinic in one of twenty-two previously selected centers, to which children are brought from the local and surrounding counties. Each child is studied from all angles—general, developmental, educational, speech, and achievement. These studies, including speech, psychological, and personality tests, and parent conferences, furnish bases for the diagnosis of the child's defect.

A total of 2,157 children were thus tested and remedial measures recommended in the first year of the clinic. Oral and written instructions were given to 1,810 parents and 2,056 teachers from 66 counties and 133 school systems. Remedial treatment for each child was demonstrated to the parent concerned, together with an explanation of the need for consistent, persistent retraining in effecting improvement. Through the media of conferences and written materials, teachers and superintendents received explanations of simple and practical methods of working with each type of speech disorder in order to give them better understanding of the defective child and his problem.

Classification of the speech cases revealed 478 stutterers and 1,643 articulatory disorders of which at least 386 were obviously organic, such as spastic paralysis, cleft lip and palate, brain injuries, tongue and jaw malformations, and the like.

The hearing section of the clinic was handled differently in that the hearing supervisor, Warren H. Gardner, visited each building in the local center and tested all children from the fourth grade up. Other schools were visited away from the center as the time allowed. The group audiometer was used for original and retests, supplemented by the pitch audiometer. A total of 44,232 children were tested. Counting 371 tests to adults, retests and pitch tests, 52,241 hearing tests were given in the nine-minth period. The average incidence of failure was 5.7 per cent, with a range of 3.4 to 9.0 per cent. Children that failed were studied from educational, personality, and physical aspects before decisions were made regarding disposition. Written instructions were given to the superintendent, teachers, and health department of each school and notices were sent to parents. Instructions included not only the desirability of physicians' examinations but special seating, lip reading, hearing aids, special coaching in weak subjects, and more consideration on the part of the teaching staff for the hearing-handicapped child.

Besides visiting twelve other centers, the clinic is making return visits this year to retest children, record the improvement, and to note the amount of response given by teachers and parents. Over 800 speech cases have been tested since September, and over 10,000 hearing tests given. All hearing failures of last year are being retested to measure improvement, if any, over previous scores and to ascertain those that received medical attention.

Although marked improvement has been noted both in hearing and speech cases, the results vary. Some parents have worked hard and conscientiously to improve the speech of their children, while other parents have done nothing. In one city, 55 per cent of the hearing

cases were sent to doctors, and only 17 per cent in another. Those receiving medical attention, in some cases, improved greatly or returned to normal, but in many other cases physicians reported nothing could be done. Among those not receiving medical attention, a substantial number showed a greater loss of hearing.

The Indiana University Speech and Hearing Clinic has not only demonstrated the efficacy of such a clinic, but its results have led to the employment of speech supervisors and additional lip reading teachers in Indianapolis and Bloomington. Also eight new audiometers have already been purchased, and more purchases are contemplated.

A monograph will be published upon the completion of the two-years' work.

WARREN H. GARDNER,
Hearing Supervisor
Indiana University Speech and Hearing Clinic

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Crippled Children

It is gratifying to observe the sympathy that people in general extend to children who are physically handicapped. A little child who has been left maimed by infantile paralysis or some other deformity that has handicapped him for life is accorded extreme attention. This testifies to the human development and civilization of mankind from the time when these unfortunates were left to shift for themselves or were destroyed. It is a mark in which we can say that man has truly progressed. The many societies that have been formed to aid the crippled child are numerous and are well received by the general public.

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However, in our shortsightedness many of us fail to recognize the truly crippled child. There are other means of being crippled in addition to deformity of legs, arms, or spinal column. There are many whom we must serve who are decidedly in a much more pitiable plight by being handicapped by a sluggish mind. They are, no doubt, in need of more sympathy than the child with the crooked spine. We expect the child with the crippled mind to conform to the same life patterns as the child with a normal mind. For some reason we do not discern his infirmity, and, therefore, accord him no sympathy.

I have had many complaints from parents to the effect that children have been dubbed "dumbbells" by their teachers. If this is true, I am sure that it has been done unthoughtfully. It has been done during one of the teacher's weaker moments. We take the greatest care not to refer to a physically crippled child's infirmity for fear we may hurt his feelings. We should exercise the same care in dealing with a mentally slow child. I am thoroughly convinced that sarcasm has no rightful place in a school room. If a child is slow, it does no good and certainly is not a kindness to taunt him with that

An Apology

The JOURNAL's attention has been called to the fact that the article, *Another Beam of Light Through the Darkness*, by O. J. Hill, published in our January issue, had previously been published in the March, 1939, issue of THE TEACHERS FORUM FOR INSTRUCTORS OF BLIND CHILDREN.

The JOURNAL was unaware that the article had also been submitted to another publication and, consequently, wishes not only to apologize for the over-sight but also herewith to withdraw all copyright claims to it in favor of the American Foundation for the Blind, Incorporated, New York City.

fact. If you have sympathy for a crippled condition, it will not relieve your own emotions to call him names. All in all calling names, and in any way making a child feel little, is futile and does not reflect the proper attitude on the part of those who resort to such practice.

Recently I have had occasion to visit many of the homes of our pupils here in Butte. I am now convinced that there is another group of crippled children who do not come under the class of the physically handicapped or mentally dull. There are many children coming to our schools who are crippled by their home environment. Attitudes and habits that have become a part of their innermost selves make it unpleasant for the school to care for them. Nevertheless, we owe a debt to society to do something for them. We are not serving our function as a school when we make school so unpleasant for them that they quit or in some other manner exclude them. We should recognize them as a problem, but we must not shirk our duty toward them just because it is hard. We should have the same sympathy for children who come from homes where they receive training only in drinking and carousing and other kinds of licentiousness as we have for children who have been crippled by accident or disease.

A recent survey has pointed out the fact that children who are excluded from school at an early age, because of low ability or poor home training, are the ones who are becoming the fathers and mothers of our largest families. That being true, we are accumulating a greater problem for our future years by neglecting our responsibilities to these neglected children today.

Bulletin Issued to Staff
by LOWELL W. JOHNSON,
superintendent of schools,
Butte, Montana

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Wisconsin Project for Making Visual Aids for the Deaf

In the fall of 1938, the Wisconsin Department of Public Instruction organized and sponsored a WPA project in visual aids for the deaf in the State of Wisconsin. At present approximately forty WPA workers, under the supervision of Joseph Rohr, Jr., are engaged in developing visual aids for the schools for the deaf in the state.

This WPA project was divided into two units: (1) flat pictures, consisting of photographs and pictures clipped from magazines and old books and various types of illustrations; and (2) models of a three dimensional type. Oshkosh, being a woodworking center, was chosen as the location of the unit for producing models. Among those made there are jig-saw maps of the United States, cut-outs of fruits, vegetables, clothing, furniture, and a complete village of ten buildings. Antigo was selected for the picture unit because of the many physically handicapped workers there who are employed on heavy work projects. In or-

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der that the workers might appreciate the importance of the work, the supervisor explained to them the vital need of such aids in the education of deaf children.

Discarded books and magazines were collected, and the workers directed to cut certain types of pictures. When picture groups had been assembled they were mounted and labeled. Then a card index and cross reference system was developed for the use of the teachers. Among the group headings are: transportation, communication, history, architecture, firefighting, geographic formations, animals, health, and famous men.

Deprived of the opportunity of imparting knowledge to pupils through the sense of hearing, the teachers of the deaf must utilize the child's sense of sight to a great degree. The written or spoken word alone does not suffice. In the case, for example, of objects too large to be brought into the schoolroom, or too far distant to be viewed by the pupils, the children may obtain vicarious experiences and concepts through the use of visual aids.

Only the educators whose field is among the deaf can realize the value of these visual aids and the projects that are supplying them. Identical sets have been supplied to the twenty-four schools for the deaf in Wisconsin, and through these aids instruction has been greatly enhanced and the learning process in these schools facilitated.

A testing program for hearing defects among children, sponsored by the Department of Public Instruction and the University of Wisconsin, is also being carried on through the cooperation and participation of the WPA.

This survey is being extended so as to take in school children in all parts of the state, and the results are being watched with keen interest by the State Medical Society of Wisconsin, and by the State Board of Health. These agencies are giving their full assistance to the project.

SAMUEL A. KIRK, *director*
Division of Education
for Exceptional Children,
State Teachers College,
Milwaukee, Wisconsin

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Fundamental Principles of Open-Air Education

ALL education has as its aim the promotion of the highest possible achievement. This aim can be reached only if it takes as a basis the natural aptitude of the individual and the environment in which he is placed.

The child has definite inherited physical and mental characteristics, and not until these are fully realized by the medical man and the teacher can the right method of education be discovered. Open-air education is considered to be the most appropriate for this realization. It provides suitable conditions for the successful development of educational methods, both in the way of classrooms and of premises in general and by the provision of a selected body of teachers who have to cooperate closely with the suitably trained school doctor and the parents.

The result of the education will in every case be decided by the inherited aptitudes of the children. Open-air education has as its aim to use to the full the child's potentialities, for the result of all education is nothing else than the interaction of heredity and educational environment; education has as its aim the highest possible assurance that the individual will achieve his utmost as a citizen.

For practical purposes, therefore, the following claims are made:

1. That all plans for new schools should take as a basic principle the methods of open-air education.
2. Where reconstruction of existing buildings is undertaken, the first aim should be to attempt to apply, as far as possible, the principles of open-air education.
3. Children chosen for open-air education should be selected after extensive consideration of their potentialities in which doctors and teachers trained for this work cooperate closely.
4. For the staffing of open-air schools, a special selection of teachers should be made to assure the proper effect of open-air methods.
5. The financing of all open-air schools is a duty of the state and of the local authorities.

Bulletin (1938, *No.* 1) *of the International Committee on Open-Air Education*

WITH APOLOGIES TO T. C.

Education has taken many queer turns, but the strangest yet is announced by Columbia University Teachers College. This institution has inaugurated a physical education course which has the purpose of teaching students how 'to do nothing'. The title of this particular course is *Methods of Relaxation.*

Topeka Capital

Showing the Way

SPECIAL education has set the aim of all education by determining each child's capabilities and limitations and directing him through the acquisition of knowledge and skills into the pursuits which will give him the greatest satisfaction.

DR. CHARLES M. MORRIS, *resident psychologist,*
The Woods School, Langhorne, Pennsylvania.

A World Challenge

OUR job as educators is not to teach youngsters to become intellectual giants, but to send them out recognizing the privileges and obligations of society.

PRESIDENT GEORGE CHIPPERFIELD, *National Union of Teachers (England)*

Shall We Segregate?

(*Continued from page* 225)

feel that there is a danger for the child to be in a school with normal children because sufficient care may not always be taken to protect the child from injury. Another parental objection is that the normal child will make fun of the handicapped child. Other parents think if the child is placed with normal children, he will be more conscious of his handicap.

Some of these objections are unjustified for normal children can be taught to be considerate of those less fortunate than themselves, and the handicapped child can develop the right attitude toward his limitation and adjust himself to normal as well as to other handicapped children.

As was stated in the beginning, the trend is away from segregation. The last complete bulletin from the Office of Education shows more pupils enrolled in special classes in regular schools than in special schools for all of the types of exceptional children mentioned.

If the same quality of instruction and the same equipment could be provided for children in special classes that is possible in a special school, there would be little need for segregation. But, in developing a special education program, it is necessary to take into account limitation as to staff and equipment, as well as the attitude of the community. Sometimes the wisest solution of a problem is not the one the community is ready to accept. However, the solution can follow a transition period during which an effort has been made to educate the community to a better understanding of the needs of exceptional children.

The Crippled Child

Devoted to the Study of

Prevention - Care - Education
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Brief Notes

Kiwanis Reports Activities

On January 22, Kiwanis International celebrated twenty-five years of service-club achievement. The first Kiwanis club was organized in Detroit, Michigan, January 21, 1915. Today there are in Canada and the United States more than 2,050 clubs, with a membership of over 104,000.

Of the 2,050 clubs, 1,743 conduct programs in behalf of one or more types of underprivileged children. Other programs of special interest, and the number of clubs conducting each, are as follows: Playgrounds, Recreation, and Athletics, 1,889; General Charity Work, 1,248; Boy Scouts, 1,203; Safety, 1,150; Vocational Guidance, 984; and Health, Sanitation, and Hospitals, 598.

Chapter Number 76 Being Organized

Word has just been received from Mrs. Ella A. Taylor of Dayton, Ohio, that the work of organizing a new chapter in that city is well under way, and that the election of officers will take place soon. The Dayton Chapter (the official name has not yet been adopted) will be designated as Chapter No. 76.

The Council takes real pleasure in welcoming Dayton into membership.

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Chapter Correspondence

Grand Rapids Announces Interesting Program

The officers of the Special Education Club of Grand Rapids, Michigan, are: PRESIDENT, Mrs. Fern Cutliff, teacher of the deaf; VICE PRESIDENT, Miss Dorothy Farr, teacher of a high school sight saving class; SECRETARY, Miss Agnes Lamoon, teacher of the mentally retarded; TREASURER, Mrs. Grace Snellink, teacher of a slow moving group; NEWS-CORRESPONDENT, Miss Gertrude Peck, teacher of an orthopedic class.

Under our general activity we are having two meetings addressed by an outstanding speaker, with a third purely social meeting. Under our special activities we have two of exceptional interest: (1) people working in the field of the mentally retarded are conducting monthly meetings, each addressed by a speaker from some agency that will later have contact with our cases; and (2) the sight saving people are working on a pamphlet that can be distributed to parents and teachers, stating the purpose of sight saving classes, and listing observable conditions and behaviors that may suggest eye trouble.

EMMA E. DENNISON, *supervisor Special Education*

Pennsylvania Conference States Objectives

The Pennsylvania Conference for the Education of Exceptional Children —a state chapter—has the following set of objectives:

1. To promote the education and training of exceptional children in Pennsylvania.
2. To formulate and advance special education standards.
3. To foster a development of special education as an integral part of public education.
4. To protect and advance the interests of its members and stimulate professional growth.
5. To hold an annual meeting the first Friday and Saturday in October.

The officers are: PRESIDENT, Neal F. Quimby; FIRST VICE PRESIDENT, Edna Righter; SECOND VICE PRESIDENT, Darrel J. Mase; RECORDING SECRETARY, Edward Donohoe; EXECUTIVE SECRETARY, Susan M. Kurzenknabe.

SUSAN M. KURZENKNABE, *Executive Secretary.*

Jackson Chapter Entertains Lansing and Battle Creek

The Lansing and the Battle Creek chapters of the International Council for Exceptional Children were recent dinner guests of the Jackson chapter at their meeting held at the Cascades' Club House in Jackson.

Dr. Francis Lord, of the Department

of Special Education, Michigan State Normal College, Ypsilanti, was the speaker of the evening. His talk was on the subject of the segregation of handicapped children. Dr. Lord presented both sides of the question and summarized several recent studies on the subject. The speaker's talk stimulated an interesting discussion in the open forum that followed.

To Dr. Lord, the speaker, and to the members of the Jackson chapter, who were most gracious hosts and hostesses, we wish to express our appreciation.

IRMA HIAR, *president*
Lansing Chapter

Lansing Chapter Promoting Inter-City Fellowship

The Lansing Chapter is seeking this year to acquaint its membership with neighboring chapters in order that Central Michigan may become a larger community of good fellowship working together for the welfare of handicapped boys and girls. It has as a result promoted one inter-city meeting and is now planning another.

One of the chapter's special activities has been an effort to build a substantial membership, coordinate its activities, and provide for individual participation in its work.

Chapter officers are: PRESIDENT, Irma T. Hiar; VICE PRESIDENT, Helen Parsons; SECRETARY-TREASURER, Iris Sturdevant.

IRMA HIAR,
President

Sioux City Chapter Announces Officers and Program

The officers of our newly organized Sioux City Chapter, Iowa, are: PRESIDENT, Miss Yuba Hunsley; VICE PRESIDENT, Miss Elizabeth Downs; SECRETARY, Mrs. Vera Edwards; TREASURER, Mr. Leo Beckard; and NEWS-CORRESPONDENT, Miss Rosalie Farley.

The general activity of the Chapter is to promote the education and welfare of exceptional children, the handicapped and the gifted. This year's special activity is to present a general picture of the problems of the exceptional child in society in respect to his educational, emotional, physical, and psychological development.

VERA EDWARDS, *secretary*

Iowa Chapter Promoting Spring Conference

The Iowa Chapter held a fall meeting in connection with our State Teachers' Association. The speaker of the occasion was Dr. Charles Scott Berry of The Ohio State University.

The special activity of the Chapter for this year is the promotion of a spring conference of Iowa teachers of exceptional children.

Our president is Miss Bess Johnson and our treasurer is Miss Ruby Van

Special School Directory

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A private boarding school for exceptional children. Homelike atmosphere. Healthful climate. Delightful out of door work. Separate school building. Individual diagnostic teaching. Correction of speech difficulties stressed. In beautiful Shenandoah Valley of Virginia.

Leah Knoche, Director, Hollins, Va.

Meter, both of Des Moines.

ARTHUR S. HILL, *assistant director*
Pupil Adjustment and Secondary Education Department
Des Moines Public Schools

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New Publications

CREATIVE EXPRESSION, *Gertrude Hartman* and *Ann Shumaker*, 350 pp., 1939, E. M. Hale and Company, Milwaukee, Wisconsin, Illustrated, cloth, $2.00.

ELEMENTS OF ABNORMAL PSYCHOLOGY, *Leo F. Kuntz*, 318 pp., 1939, Edward Brothers, Ann Arbor, Michigan, paper or cloth, $3.00 and $3.50.

HOW TO OVERCOME STAMMERING, *Mabel Gifford*, 169 pp., 1940, Prentice-Hall, 70 Fifth Avenue, New York City, cloth, $2.25.

MECHANISM OF THOUGHT, IMAGERY, AND HALLUCINATION, *Joshua Rosett*, 289 pp., 1939, Columbia University Press, Morningside Heights, New York City, Drawings, cloth, $3.00.

MENTAL HEALTH THROUGH EDUCATION, *W. Carson Ryan*, 328 pp., 1938, The Commonwealth Fund Division of Publications, 41 E. 57th St., New York City, cloth binding, $1.50.

MINOR MENTAL MALADJUSTMENTS IN NORMAL PEOPLE, *J. E. Wallace Wallin*, 298 pp., 1939, Duke University Press, Durham, North Carolina, $3.00.

ORGANIZATION AND TEACHING OF SOCIAL AND ECONOMIC STUDIES IN CORRECTIONAL INSTITUTIONS, *Glen M. Kendall*, 159 pp., 1939, Bureau of Publications, Columbia University, New York City, cloth, $1.85.

PARENTS AND CHILDREN GO TO SCHOOL, *Dorothy Walter Baruch*, 504 pp., 1939, Scott, Foresman and Company, New York City, Photographs, cloth, $3.00.

SPEECH CORRECTION PRINCIPLES AND METHODS, *C. Van Riper*, 434 pp., 1939, Prentice-Hall, 70 Fifth Avenue, New York City, cloth, $2.50.

YOUR EXPERIMENT IN LIVING, *Michael A. Cassidy* and *Helen Gay Pratt*, 153 pp., 1939, Reynal and Hitchcock, 386 Fourth Avenue, New York City, cloth, $1.75.

Tests

EXAMINER'S READING DIAGNOSTIC RECORD FOR HIGH SCHOOL AND COLLEGE STUDENTS, *Ruth Strang*, 20 pp., 1939, Bureau of Publications, Teachers College, Columbia University, New York City, 25 cents.

Education Meetings

ADMINISTRATIVE COUNCIL OF THE NATIONAL SOCIETY FOR CRIPPLED CHILDREN—*Asheville, North Carolina*—October 4-5, 1940

AMERICAN ASSOCIATION FOR HEALTH, PHYSICAL EDUCATION, AND RECREATION—*Chicago, Illinois*—April 24-27, 1940

AMERICAN SCHOOL HEALTH ASSOCIATION AND THE AMERICAN PUBLIC HEALTH ASSOCIATION —*Detroit, Michigan*—October, 1940

ASSOCIATION FOR CHILDHOOD EDUCATION—*Milwaukee, Wisconsin*—April 28-May 3, 1940

CENTRAL STATES SPEECH ASSOCIATION—*Terre Haute, Indiana*—April 18-20, 1940

CHILD WELFARE LEAGUE OF AMERICA—*Milwaukee, Wisconsin*—March 28-30, 1940

MICHIGAN ASSOCIATION OF TEACHERS OF SPEECH —*Ann Arbor, Michigan*—April 26, 1940

MICHIGAN CONFERENCE FOR EDUCATION OF EXCEPTIONAL CHILDREN—*Flint, Michigan*—May 10-11, 1940

NATIONAL EDUCATION ASSOCIATION—*Milwaukee, Wisconsin*—June 30-July 4, 1940

NATIONAL SOCIETY FOR CRIPPLED CHILDREN— *Asheville, North Carolina*—October 6-9, 1940